

Work Order ID 53880

November 23, 2009 11:02:18 AM

split ①



Page 1

Item ID: D4013-041

Accept



Setup Start



Revision ID:

Stop



Item Name: Wearplate Assembly

Start Date: 11/26/2009 Start Qty: 12.00



Cust Item ID:

Required Date: 12/2/2009 Req'd Qty: 12.00



Customer:

Reference:

Run Start



Approvals: Process Plan: umf

Date: 09-11-23, Tooling:

Date:

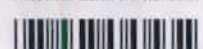
QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Draw Number	Draw Rev.	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	----------------	--------------	--------------	---------------	---------------	------------------	----------------

Draw Nbr

Revision Nbr

D4013

C

0.00



Waterjet

0.00

FLOW CNC Waterjet

Memo

1-Cut as per Dwg D4013-1

Dwg Rev: E

Prog Rev: E

2-Deburr if necessary

18 9-11-25



0.00

QC2- Inspect parts off machine FAI/FAIB

0.00

Memo

110



QC

Quality Control

18 9-11-25

304
.063

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 53880

November 23, 2009 11:02:18 AM



Page 2

Item ID: D4013-041

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Cust Item ID:

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Customer:

Reference:

Run Start



Approvals:

Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

120

QC8- Inspect parts - second check

0.00



QC

Memo

0.00

Quality Control

275 09/11/26

100% to +20

130

Bend as per dwg

0.00



Brake NC

Memo

0.00

Brake NC

80 09/11/24

20

140

QC5- Inspect part completeness to step on W/O

0.00



QC

Memo

0.00

Quality Control

275 09/11/26

100% to +20

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 53880

November 23, 2009 11:02:18 AM



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Item ID: D4013-041

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Setup Start



Revision ID:

Item Name: Wearplate Assembly

Stop



Start Date: 11/26/2009 Start Qty: 12.00



Cust Item ID:

Required Date: 12/2/2009 Req'd Qty: 12.00

Customer:

Reference:

Run Start



Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

150

0.00



Large Fab

Memo

0.00

1- Weld cup, stud as per dwg use DT9550

A/R S.S. ROD BATCH: M108160

2- Apply hardfacing on wearplate and on studs (studs only 5 places not the cups)
as indicated on dwg

A/R HARDCOAT 2059B BATCH: M112963

EL

9-12-11



160

0.00



QC

Quality Control

QC5- Inspect part completeness to step on W/O

Memo

0.00

Handed Qty +12 (au) on Bear Paw

2) S on 12/11

B



φ

170

0.00



QC

Quality Control

QC9- Inspect visual per QSI004- Fusion Welds

Memo

0.00

φ

6/10/12/11

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 53880

November 23, 2009 11:02:18 AM



Page 4

Item ID: D4013-041

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Revision ID:

Stop



Item Name: Wearplate Assembly

Start Date: 11/26/2009 Start Qty: 12.00



Cust Item ID:

Required Date: 12/2/2009 Req'd Qty: 12.00



Customer:

Reference:

Run Start



Approvals:

Process Plan:

Date:

Tooling:

Date:

QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Draw
Number

Draw
Rev.

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

180

Black Sandtex(Ref:4.3.5.7) per QSI005 4.3

0.00



M 109091

Powdercoat

Memo

0.00

Powder Coating

MASK THREADS AND HEXAGONAL OPENING PRIOR TO PAINTING

*9:00 START.
320° TEMP.
9:30 FINISH.*

BK 09-12-14, (12)

190

QC3- Inspect Part Finish

0.00



QC

Memo

0.00

Quality Control

7 HL 09/12/11

(X12)

200

Identify as per dwg & Stock Location: _____

0.00



Packaging

Memo

53878 X12

0.00

Packaging

3309/12/15

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Work Order ID 53880

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Page 5

Item ID: D4013-041

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Item Name: Wearplate Assembly

Start Date: 11/26/2009 Start Qty: 12.00



Cust Item ID:

Required Date: 12/2/2009 Req'd Qty: 12.00

Customer:

Reference:

Run Start



Approvals:

Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run HoursDraw
NumberDraw
Rev.Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

210



QC

Quality Control

QC21- Final Inspection - Work Order Release

0.00

Memo

0.00

09/12/17

W 09.12.16

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

November 23, 2009 11:02:18 AM

Page 1

Work Order ID: 53880



Parent Item: D4013-041



Parent Item Name: Wearplate Assembly

Start Date: 11/26/2009

Required Date: 12/2/2009

Comments: IPP RevA: New issue 09.10.26 DD verified by:JLM
RevB prelim per ECN09-698p 09.11.02 DD verified
by:EC
redesign 09.11.12 DD verified by:EC

IPP RevB:

Start Qty: 12.00

Required Qty: 12.00

IPP RevC:

IPP RevD: revC as per

M304S16GA

Purchased

No

100

sf

113.8637

12.2526



304/316 Sheet .063

B9-11-3

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

MAT

113.8636737

106860

16.018

111924

25.1689737

112442

29.8899

112567

0.2973

112885

42.4895

112885

D4013-3

Manufactured

No

150

Each

20.0000

36.0000



Stud

EL 9-12-7

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

WA

20

20

53827 X3

53940 X33

EL

D4013-5

Manufactured

No

150

Each

0.0000

72.0000



Cup

EL 9-12-7

B53828 X 8
B53841 X 64

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector
		B23851 X 3 B23858 X 3					

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

Picklist Print

November 23, 2009 11:02:18 AM

Page 2

Work Order ID: 53880



Parent Item: D4013-041



Parent Item Name: Wearplate Assembly

Start Date: 11/26/2009

Required Date: 12/2/2009

Comments: IPP RevA: New issue 09.10.26 DD verified by:JLM
RevB prelim per ECN09-698p 09.11.02 DD verified
by:EC
redesign 09.11.12 DD verified by:EC

IPP RevB:

Start Qty: 12.00

Required Qty: 12.00

IPP RevC:

IPP RevD: revC as per

D4013-9

Manufactured

No

150

Each

41.0000

24.0000



Stud



EL 9-12-7

Warehouse

Loc Qty

Loc Code

Location

Main Warehouse

ST

53829

41

41

53948

x21

+3

3

D4013-11

Manufactured

No

150

Each

0.0000

24.0000



Stud



EL 9-12-7

B53830 x22

B53954 x22

November 23, 2009 11:02:18 AM

Shop Packet Print

Page 2

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD		Work Order: 53880
Description: WEAR PLATE		Part Number: D4013-041
Inspection Dwg: D4013-1 Rev: C		Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

☒ First Article ☐ Prototype

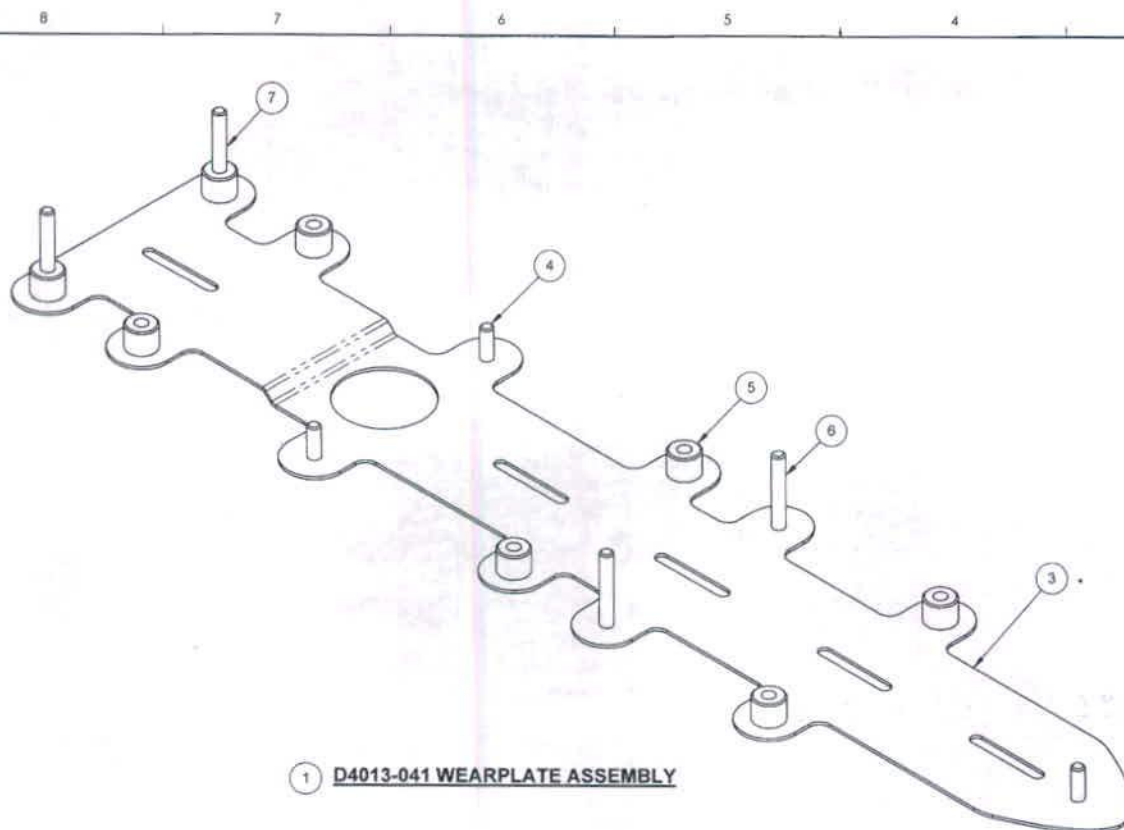
Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
Ø .250	+ .005 - .001	.254	✗			
Ø .625	+ .008 - .001	.627	✗			
Ø 1.88	+ .012 - .001	1.880	✗			
.250	± .010	.253	✗			
1.750	± .010	1.754	✗			
1.50	± .030	1.503	✗			
2.125	± .010	2.128	✗			
2.75	± .030	2.75	✗			
.625	± .010	.625	✗			
2.938	± .010	2.934	✗			
6.876	± .010	6.876	✗			
7.271	± .010	7.270	✗			
12.146	± .010	12.146	✗			
14.458	± .010	14.458	✗			
18.458	± .010	18.458	✗			
23.958	± .010	23.958	✗			
25.04	± .030	25.04	✗			
.063	± .010	.060	✗			

Measured by: RB
Date: 9-11-20

Audited by: S
Date: 09/14/20

Prototype Approval:	N/A
Date:	N/A

Rev	Date	Change	Revised by	Approved
A		New Issue	KJ/JLM	



1 D4013-041 WEARPLATE ASSEMBLY

ITEM	QTY -041	P/N	DESCRIPTION
1	X	D4013-041	WEARPLATE ASSEMBLY
3	1	D4013-1	WEARPLATE
4	3	D4013-3	STUD
5	6	D4013-5	CUP
6	2	D4013-9	STUD
7	2	D4013-11	STUD
21	A/R	2059B	HARDCOAT

#53880

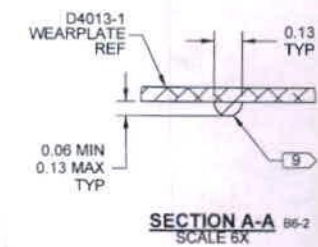
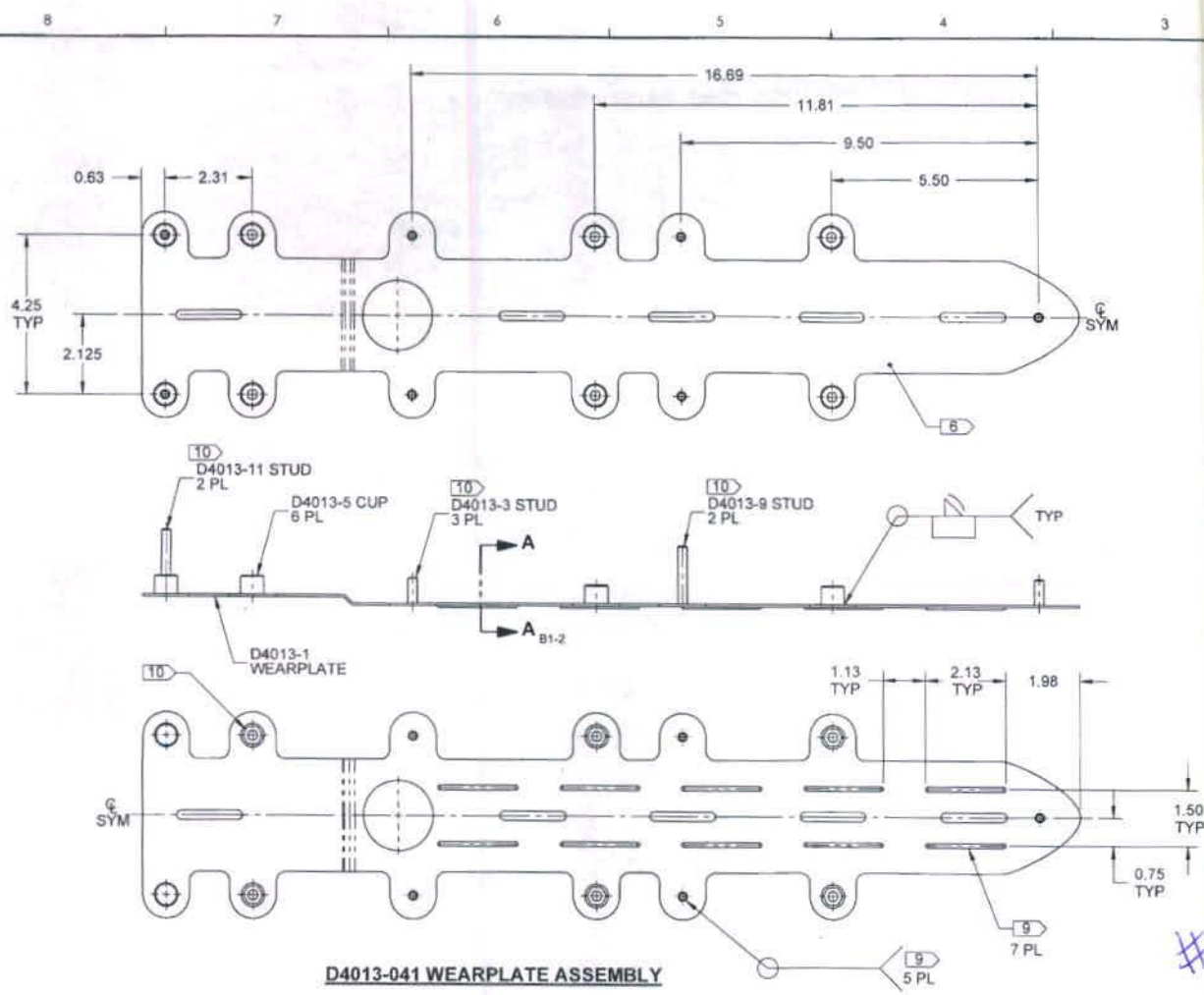
RELEASED
2009-11-24
MP

C	SIMPLIFY DESIGN FOR MANUFACTURING PURPOSES; REDESIGNED ITEM 5; ELIMINATED D4013-7 CUP (NO LONGER USED); CHANGED FINISH FROM GREY TO BLACK SANDTEX	MB	09.11.11
B	REDESIGN	MB	09.11.02
A	NEW ISSUE	MB	09.10.22
REV.	DESCRIPTION	BY	DATE
DESIGN	LA		
DRAWN	LA		
CHECKED	ASS		
MFG. APPR.	AS		
APPROVED	AD		
DE APPR.	TH		
DATE	09.11.11		

DART AEROSPACE LTD
HAWKESBURY, ONTARIO, CANADA

DRAWING NO. **D4013** REV. C
SHEET 1 OF 5
TITLE **WEARPLATE ASSEMBLY** NTS

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RELEASED
2009-11-24

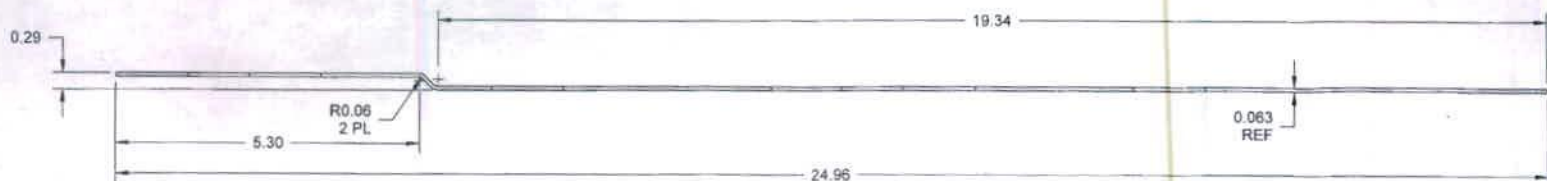
#53880

NOTES:

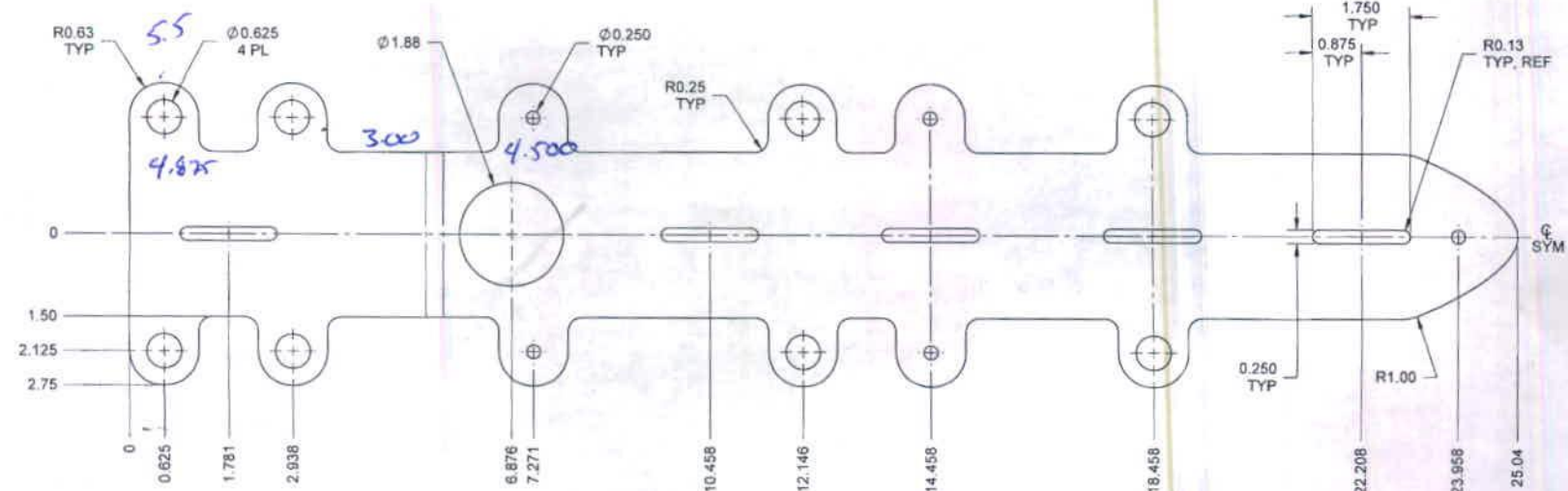
- 1) MATERIAL: SEE SHEETS 3 AND 4
- 2) FINISH: POWDER COAT "BLACK SANDEXT" (4.3.5.7) PER DART QSI 005 4.3
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: N/A
- 6) IDENTIFICATION: IDENTIFY WITH DART P/N "D4013-041" USING FINE POINT PERMANENT INK MARKER
- 7) WEIGHT: 1.89 lbs
- 8) WELDING: PER QSI 004
- 9) 2059B HARDCOAT WELD, 10 PL
- 10) MASK THREADS (7 PL) AND HEXAGONAL OPENINGS (6 PL) PRIOR TO PAINTING

DESIGN	1A	DART AEROSPACE LTD	
DRAWN	1A	HAWKESBURY, ONTARIO, CANADA	
CHECKED	1A	DRAWING NO.	REV. C
MFG. APPR.	1A	D4013	SHEET 2 OF 5
APPROVED	1A	TITLE	SCALE
DE APPR.	1A	WEARPLATE ASSEMBLY	NTS
DATE	09.11.11	COPYRIGHT © 2009 BY DART AEROSPACE LTD	

8 7 6 5 4 3 2 1



D4013-1 WEARPLATE
(MAKE FROM D4013-1F)



D4013-1F WEARPLATE FLAT PATTERN

NOTES:

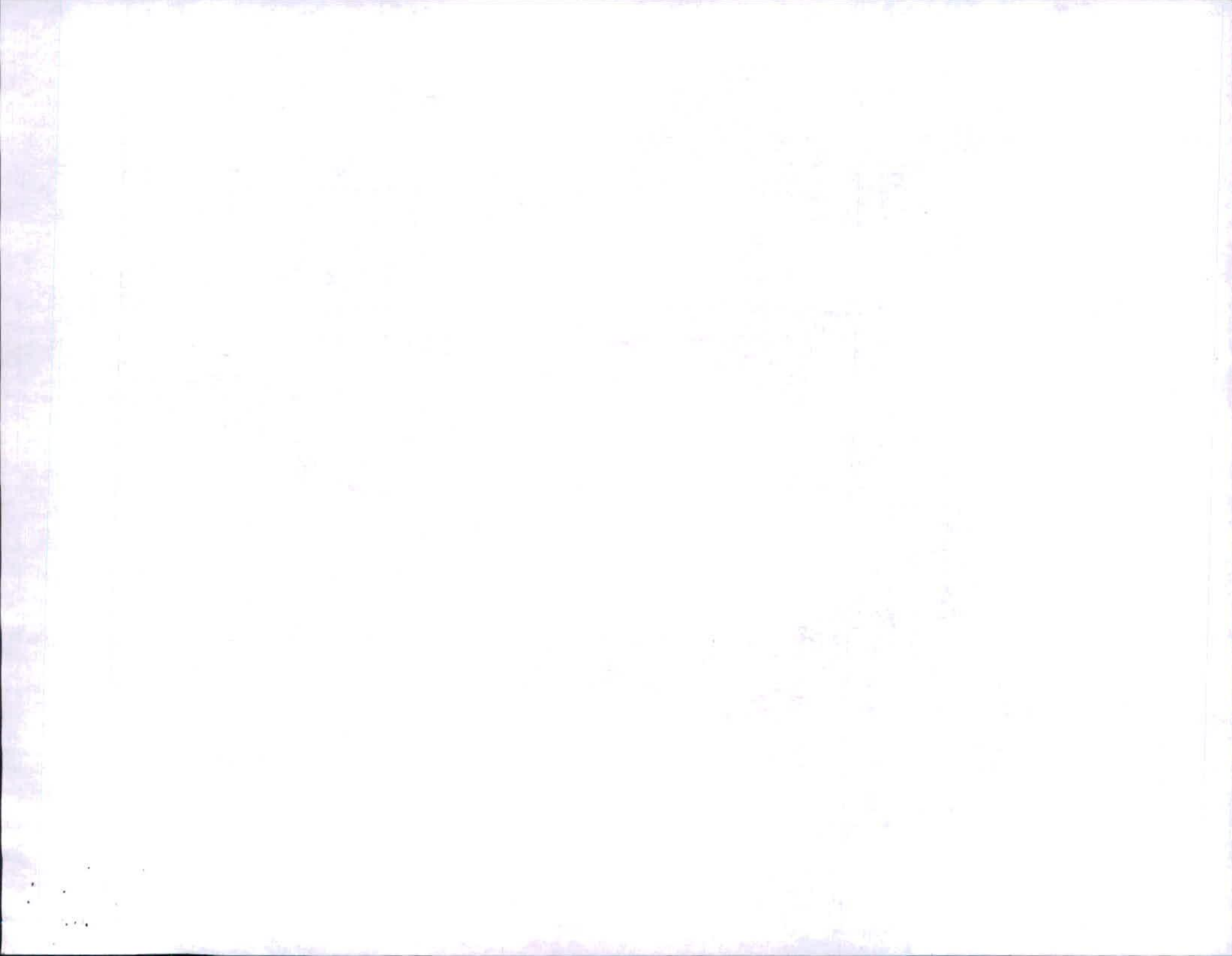
- 1) MATERIAL: AISI 304/316 STAINLESS STEEL SHEET ANNEALED 2B FINISH, 16 GAUGE (0.063 THICK)
PER AMS 5513 (304) OR 5524 (316) OR ASTM A240 OR ASME SA240
REF. DART SPEC. M304S16GA
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: 1.48 lbs

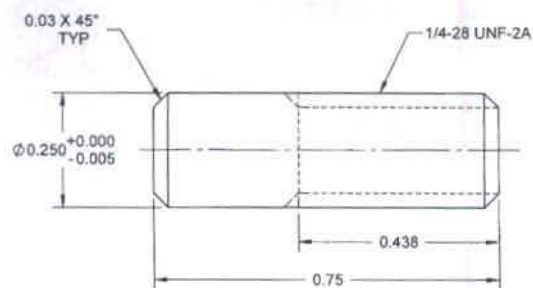
#53880

RELEASED
2009-11-25

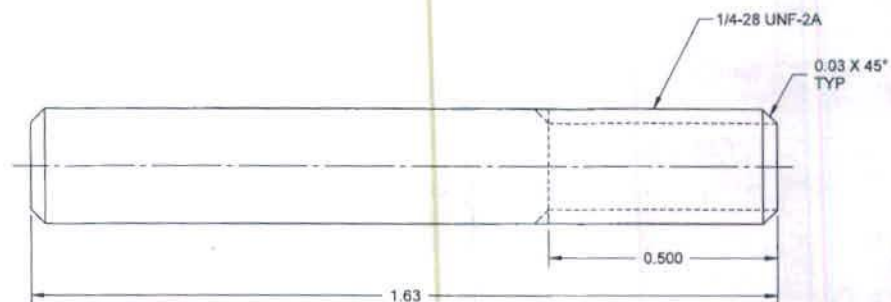
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DRAWN	AS	HAWKESBURY, ONTARIO, CANADA	
CHECKED	AS	DRAWING NO.	REV. C
MFG. APPR.	AS	D4013	SHEET 3 OF 3
APPROVED	AS	TITLE	SCALE
DE APPR	AS	WEARPLATE ASSEMBLY	NTS
DATE	09.11.11	<small>COPYRIGHT © 2009 BY DART AEROSPACE LTD. THIS DOCUMENT IS PROPERTY OF DART AEROSPACE LTD. AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS WITHOUT THE WRITTEN PERMISSION OF DART AEROSPACE LTD.</small>	

8 7 6 5 4 3 2 1

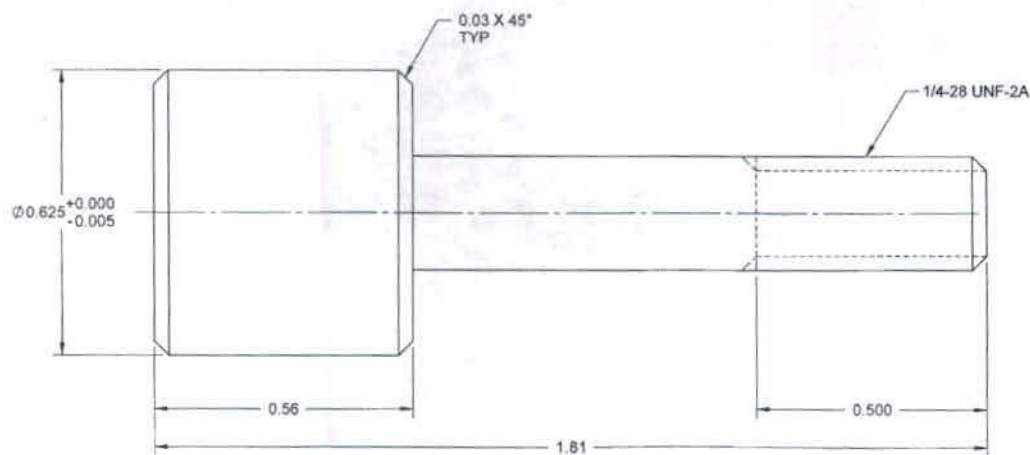




D4013-3 STUD



D4013-9 STUD



D4013-11 STUD

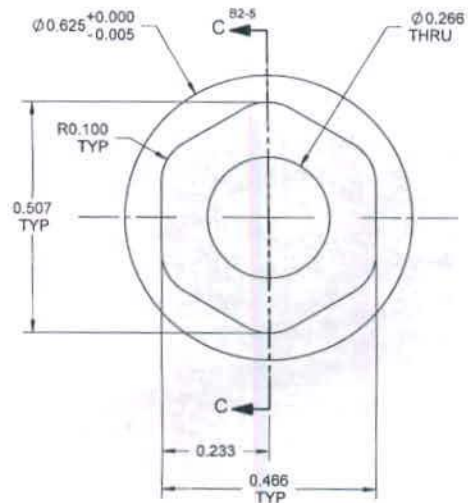
NOTES:

- 1) MATERIAL: AISI 304/316 STAINLESS STEEL ROUND BAR
REF. DART SPEC. M304R
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: LESS THAN 0.01 lbs EACH

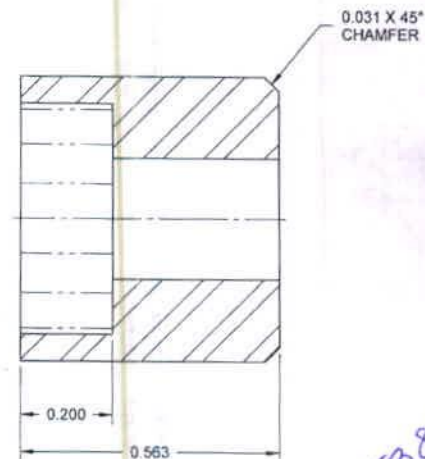
#53880

RELEASED
2009-11-24

DESIGN	<i>LS</i>	DART AEROSPACE LTD	
DRAWN		HAWKESBURY, ONTARIO, CANADA	
CHECKED	<i>ASS</i>	DRAWING NO.	REV. C
MFG APPR.	<i>DB</i>	D4013	SHEET 4 OF 5
APPROVED	<i>MA</i>	TITLE	SCALE
DE APPR.		WEARPLATE ASSEMBLY	NTS
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D4013-5 CUP



SECTION C-C D6-5

#53880

RELEASED
2009-11-24
MD

NOTES:

- 1) MATERIAL: AISI 304/316 STAINLESS STEEL ROUND BAR PER ASTM A276
REF. DART SPEC. M304R
- 2) FINISH: NONE
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: 0.03 lbs EACH

DESIGN	LA	DART AEROSPACE LTD	
DRAWN	A	HAWKESBURY, ONTARIO, CANADA	
CHECKED	ALS	DRAWING NO.	REV. C
MFG. APPR	DS	D4013	SHEET 5 OF 5
APPROVED	MD	TITLE	SCALE
DE APPR	SH	WEARPLATE ASSEMBLY	NTS
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